



1 / 23

FIG. 1a

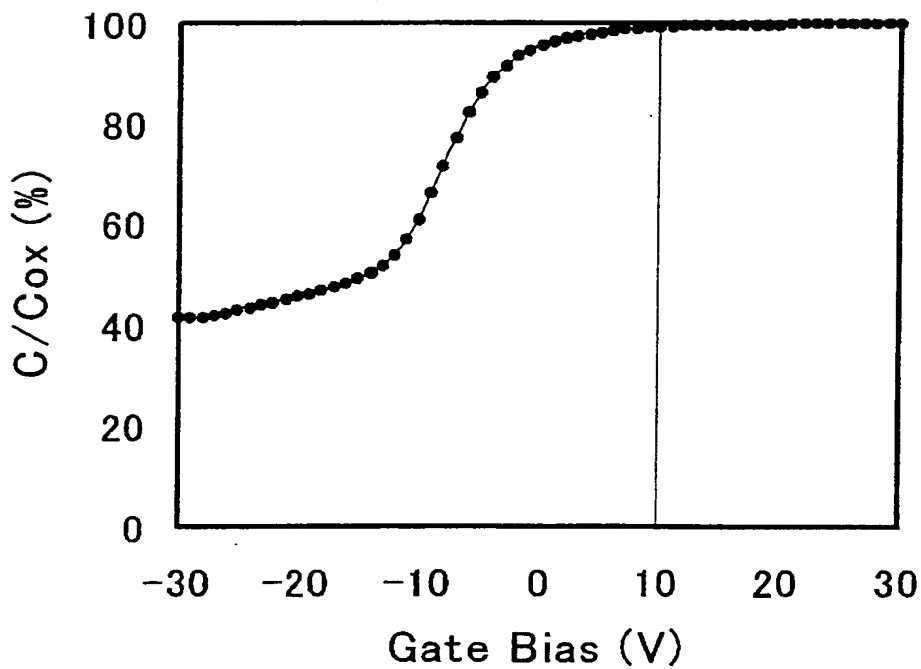
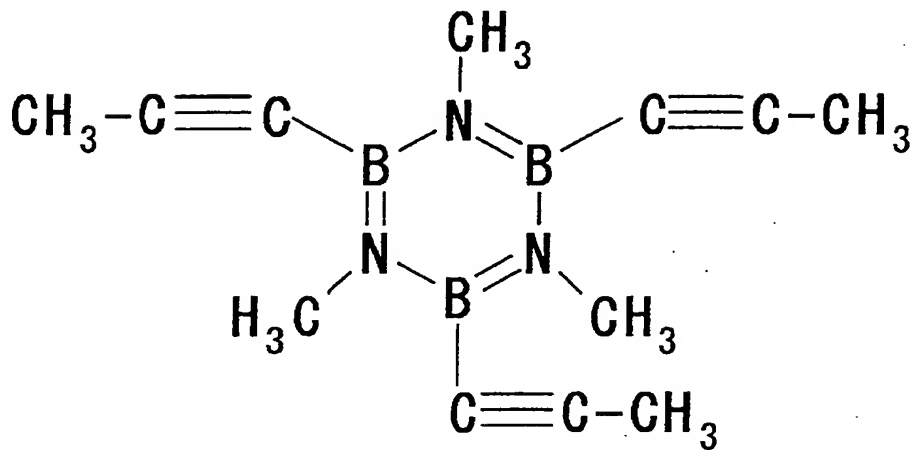


FIG. 1b

2 / 23

FIG. 2a

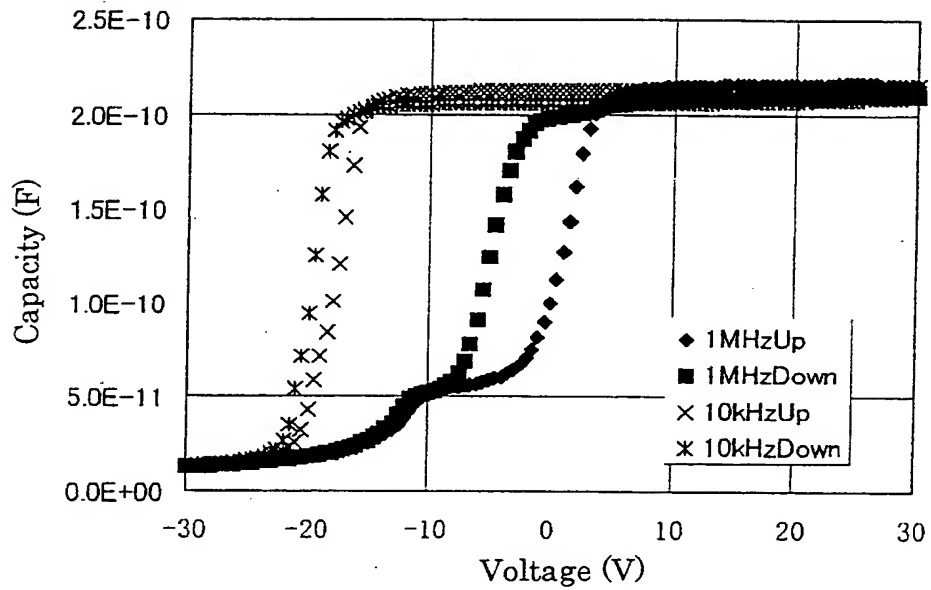
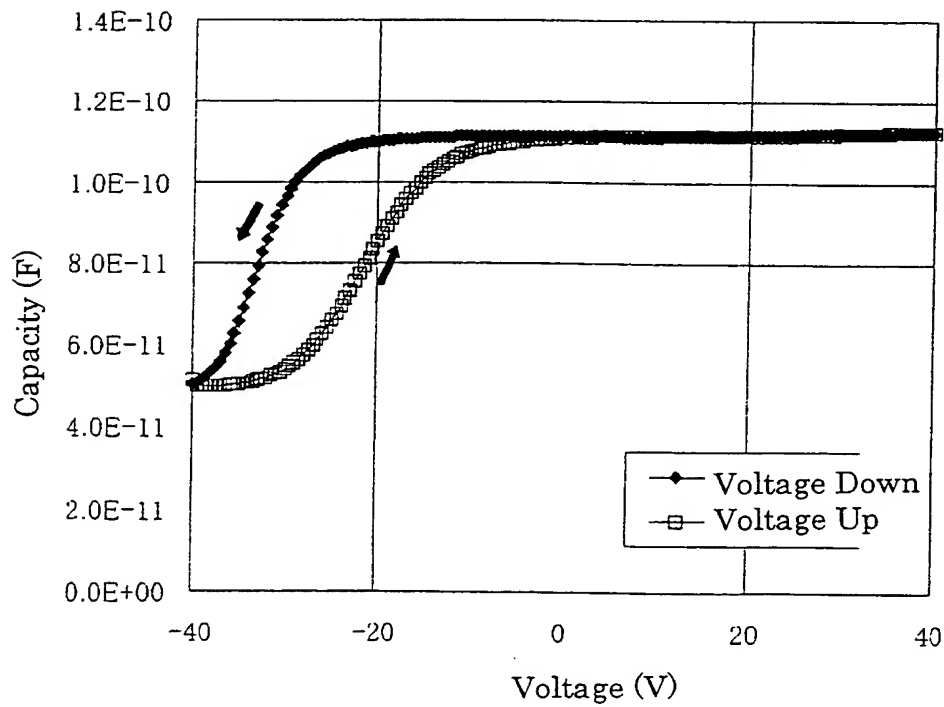


FIG. 2b



3 / 23

FIG. 3a

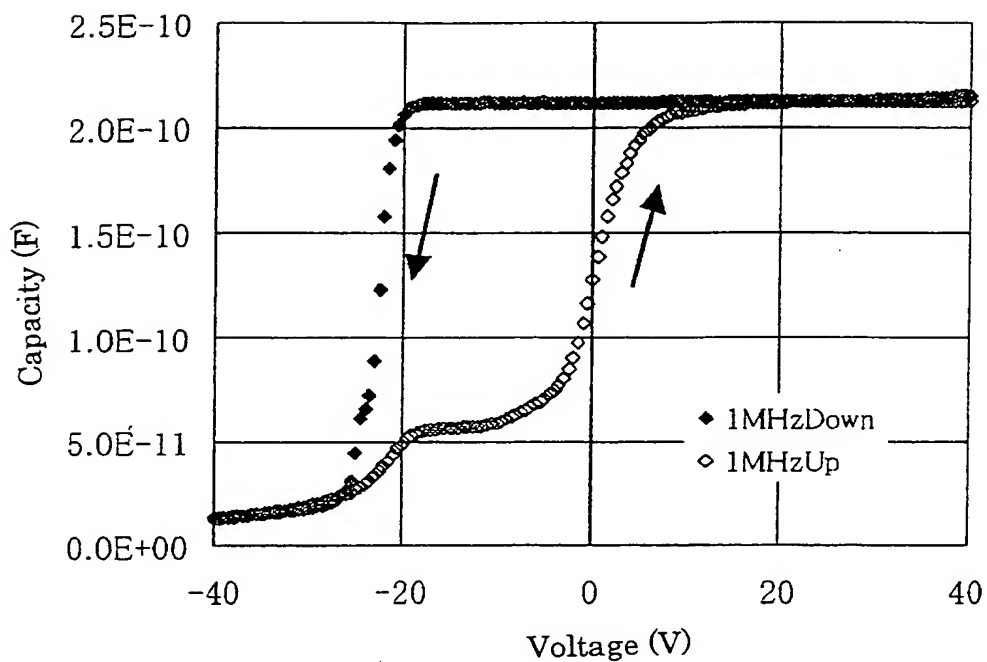


FIG. 3b

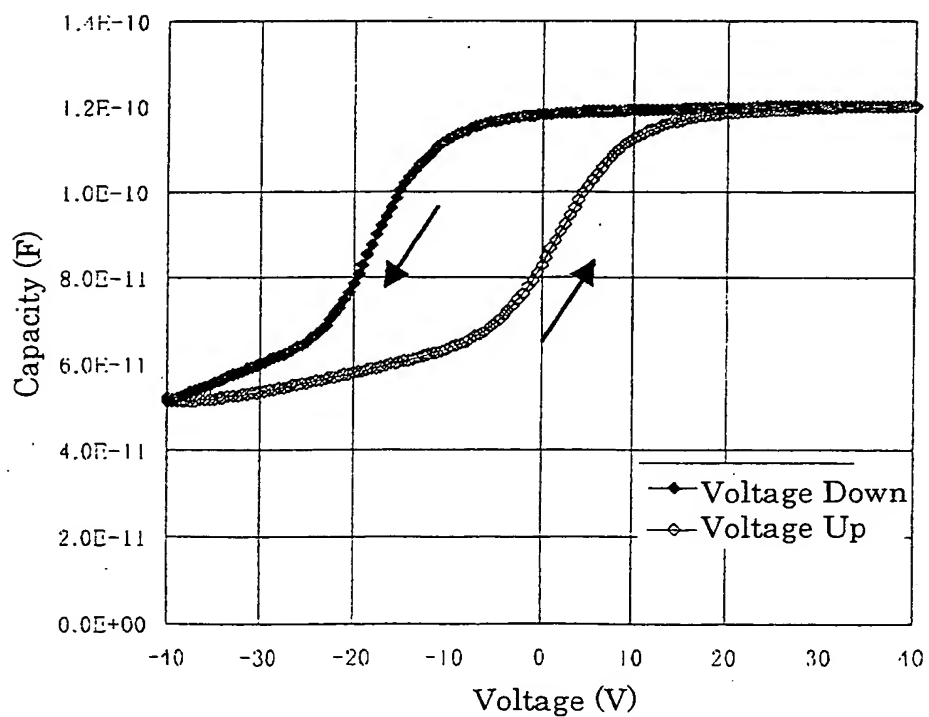


FIG. 4a

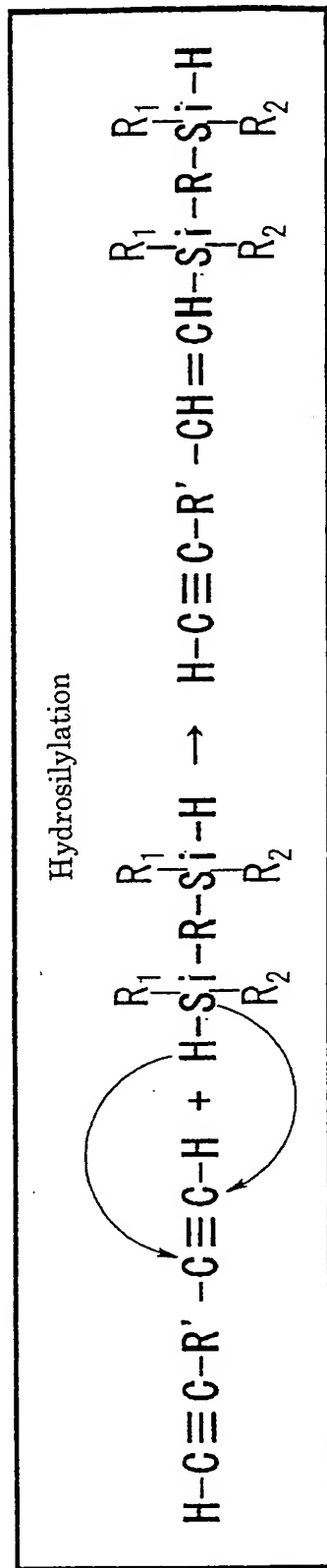


FIG. 4b

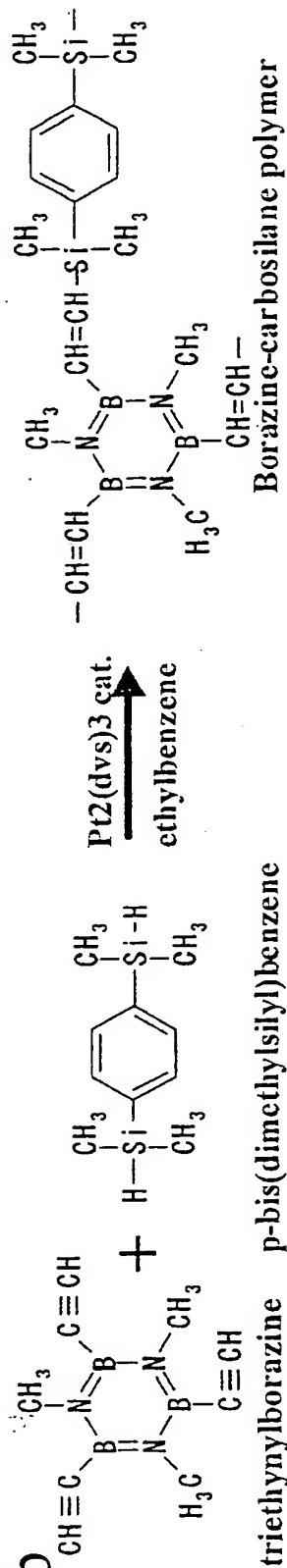
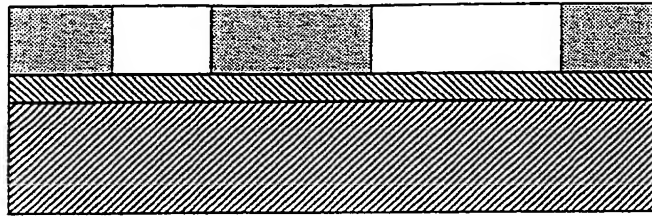


FIG. 4c



Attachment of metal mask to sample



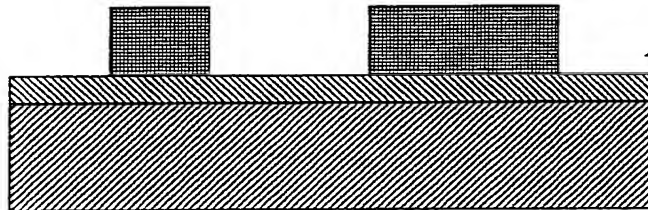
Metal mask

Borazine polymer

Silicon substrate

FIG. 5a

Removal of mask after evaporation of aluminum



Aluminum electrode

FIG. 5b

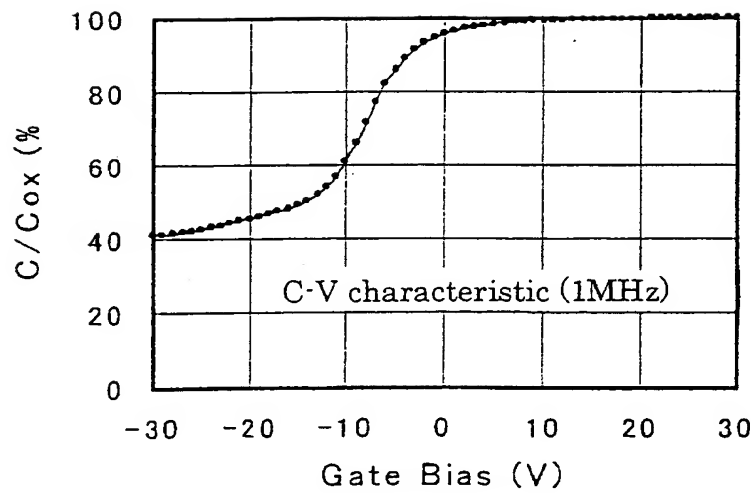
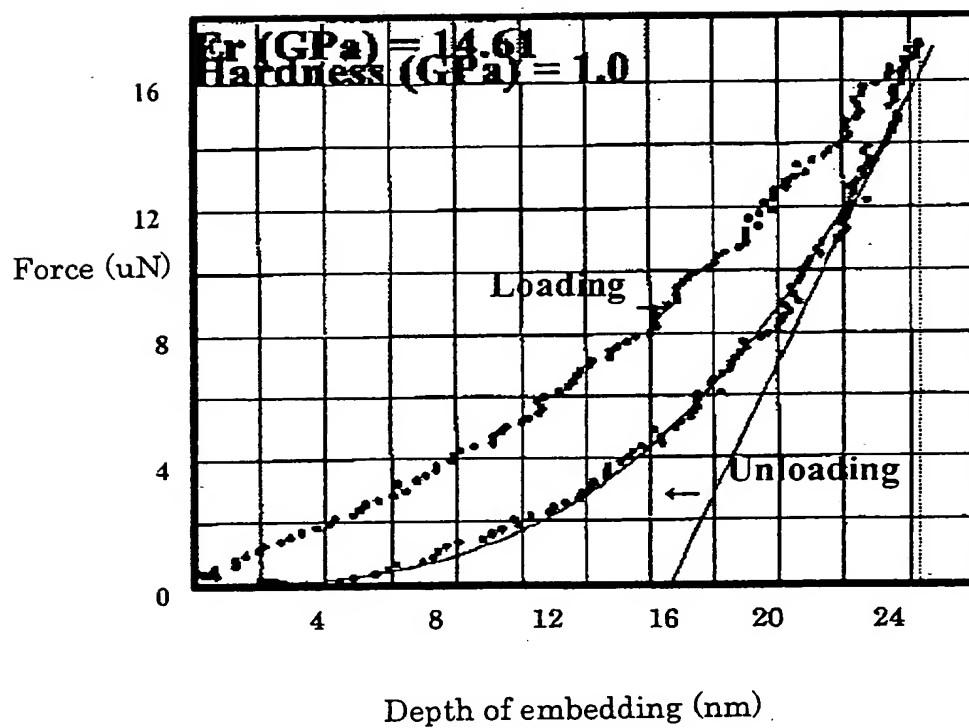


FIG. 5c

6 / 23

FIG. 6



7 / 23

FIG. 7a

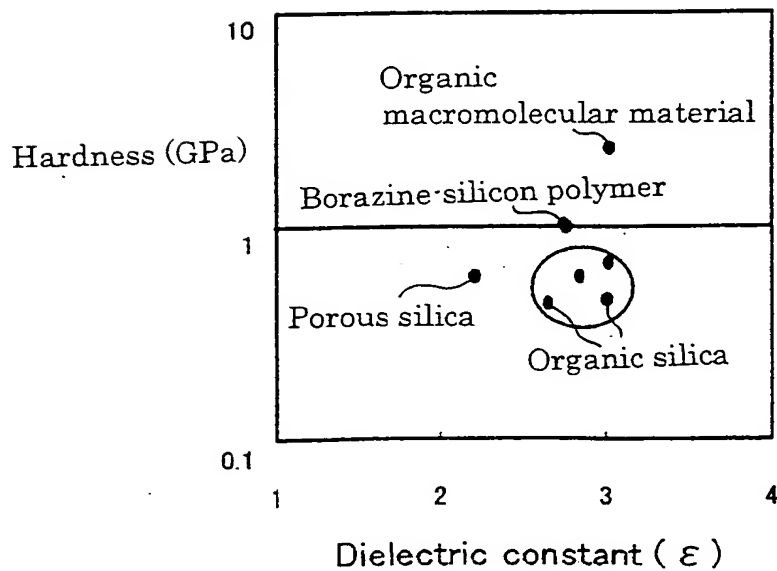
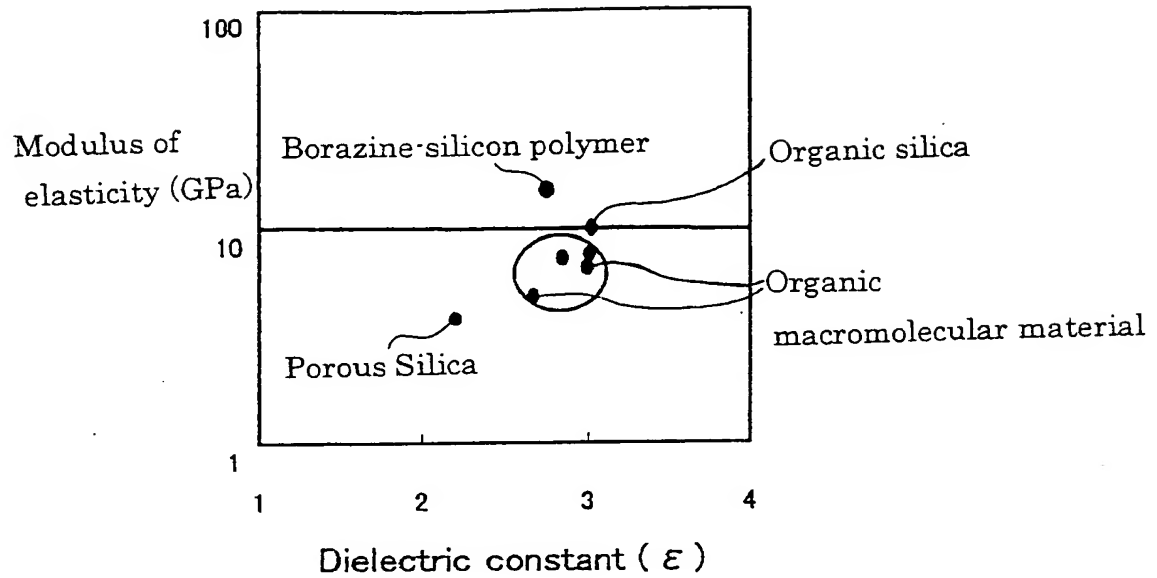
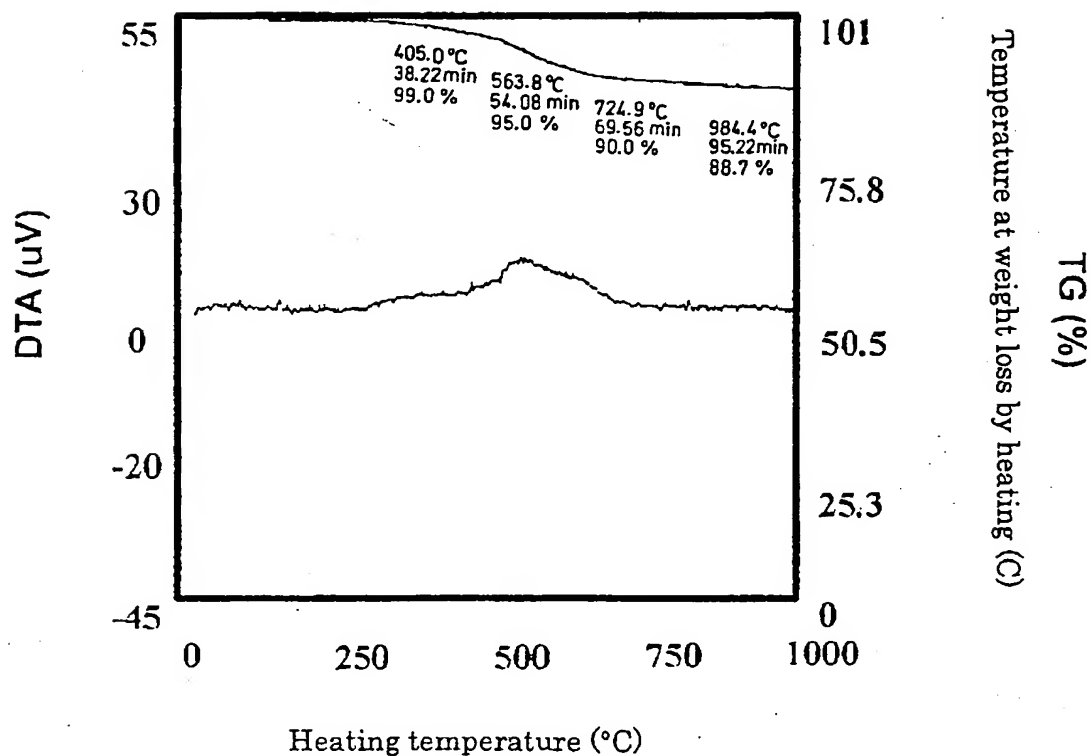


FIG. 7b

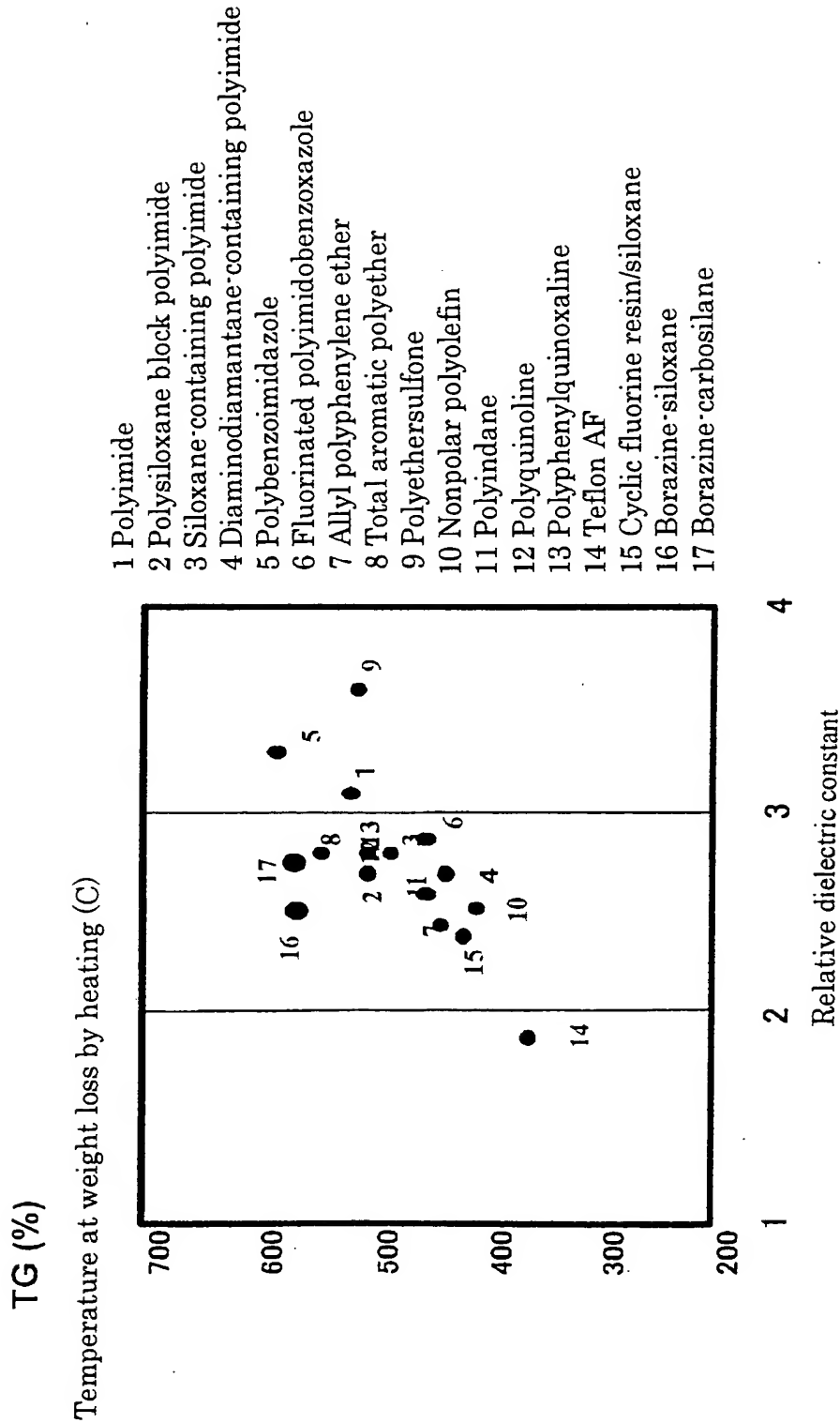
8 / 23

FIG. 8



9 / 23

FIG. 9



10 / 23

FIG. 10

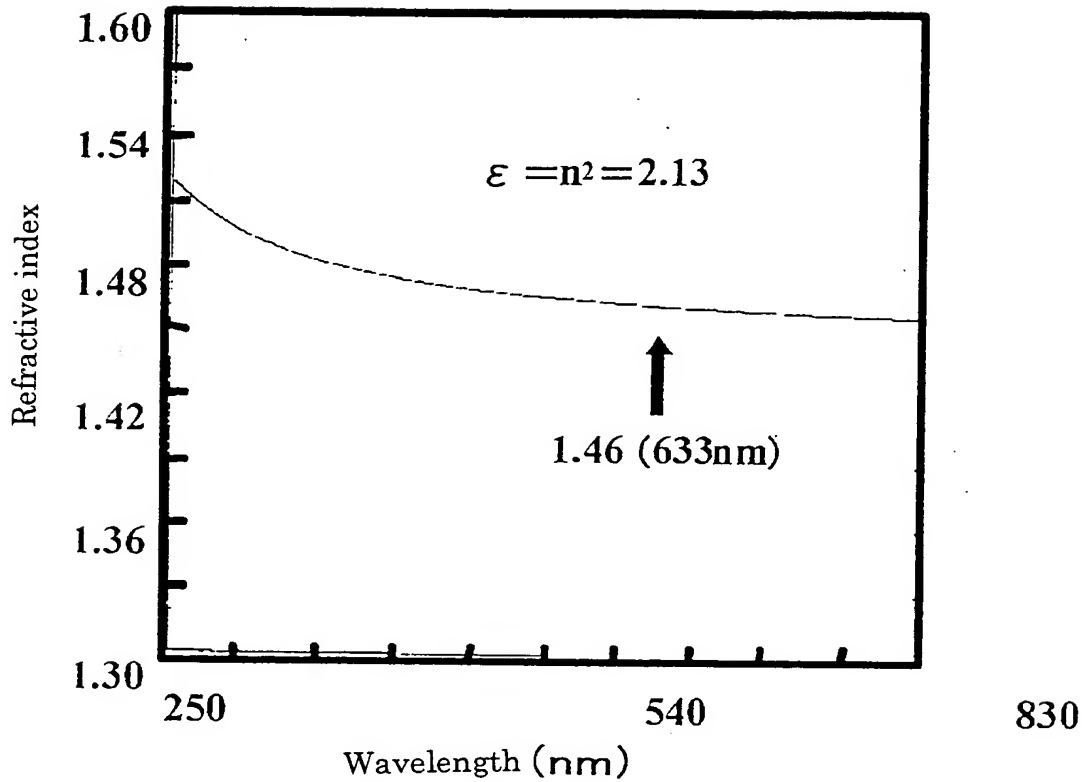
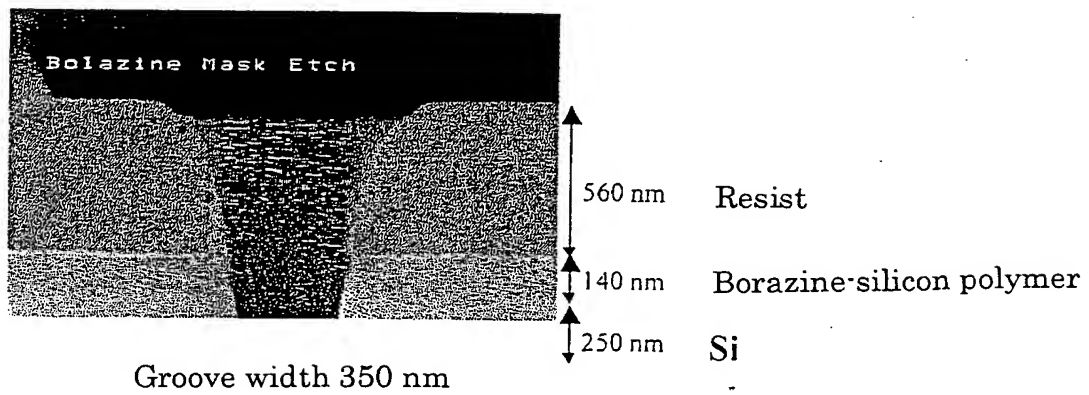


FIG. 11



11 / 23

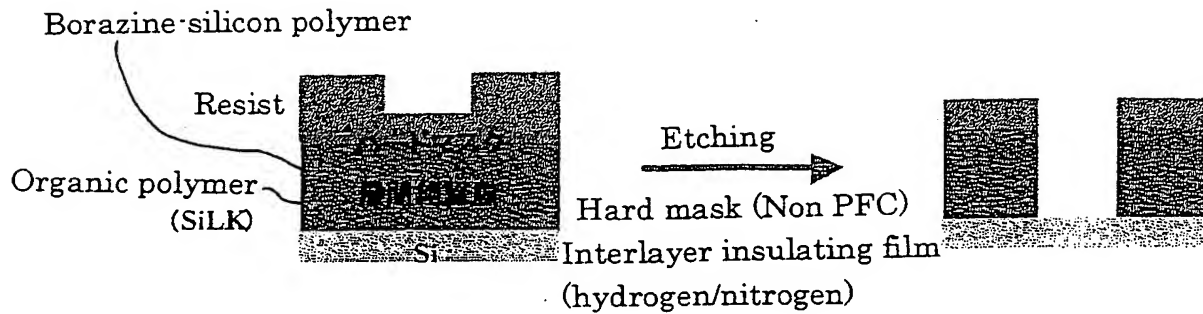


FIG. 12a

FIG. 12b

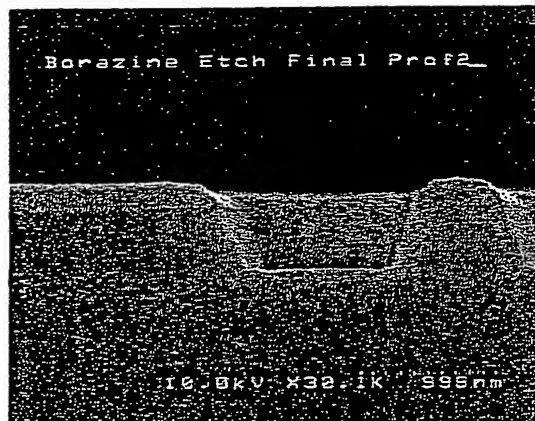


FIG. 12c



FIG. 12d

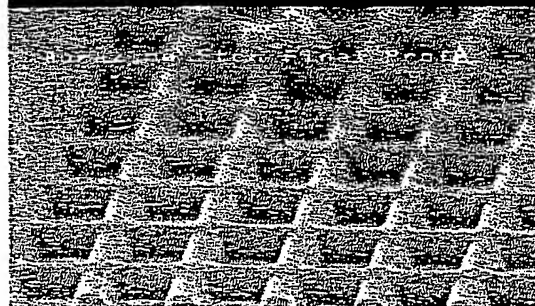


FIG. 13a

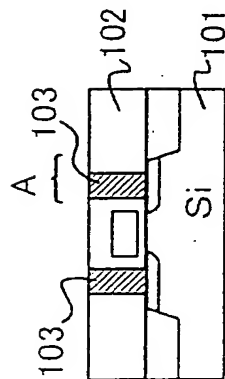


FIG. 13b

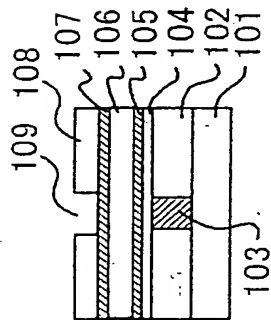


FIG. 13C

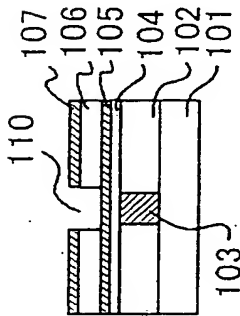


FIG. 13d

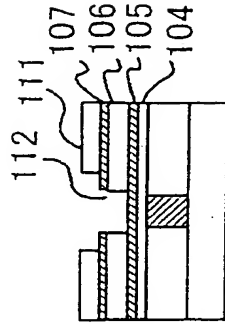


FIG. 13e

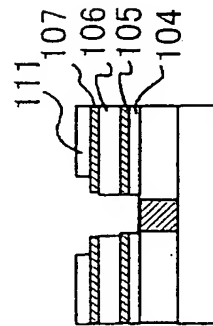


FIG. 13f

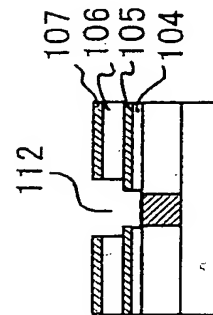


FIG. 13g

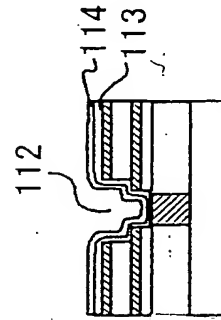


FIG. 13h

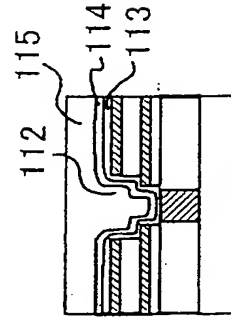


FIG. 13i

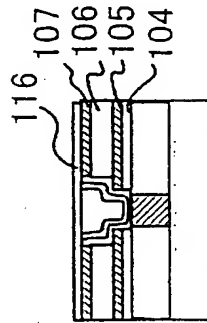


FIG. 13j

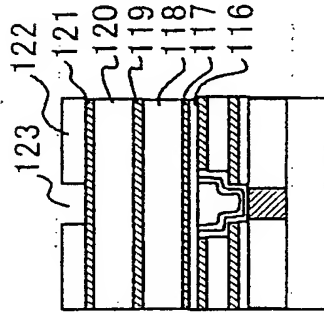


FIG. 13k

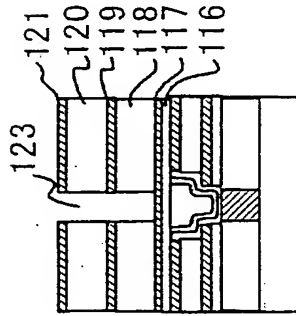


FIG. 13l

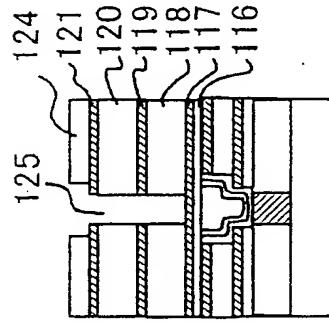


FIG. 13m

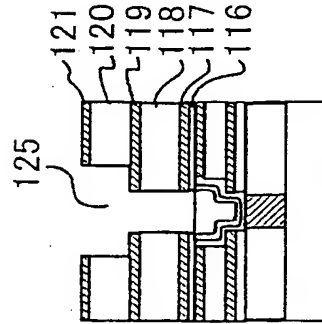


FIG. 13n

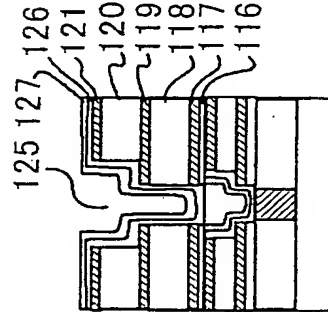


FIG. 13o

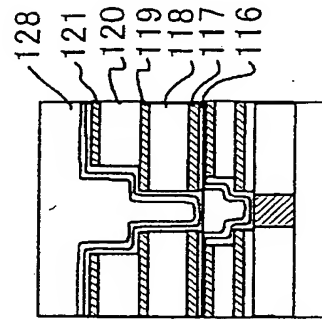
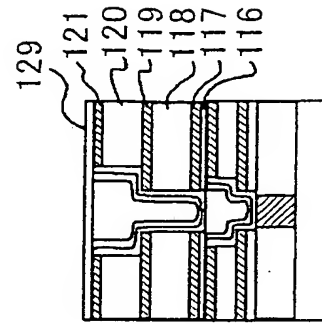
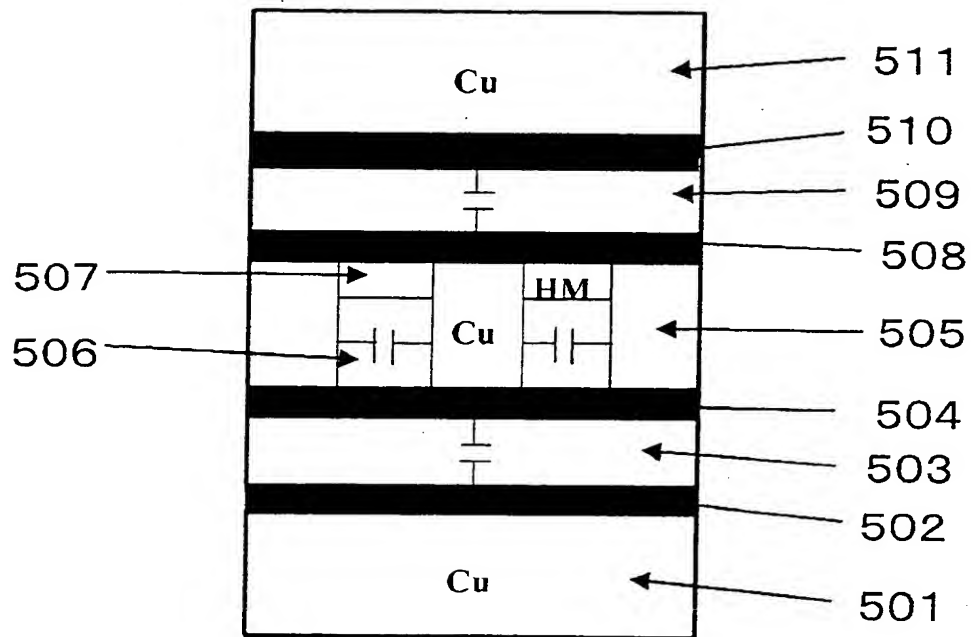


FIG. 13p



13 / 23

FIG. 14



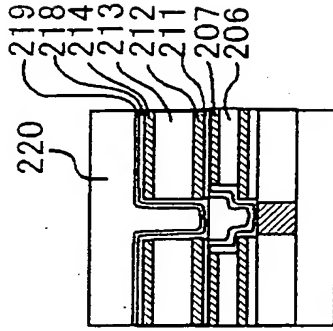


FIG. 15d

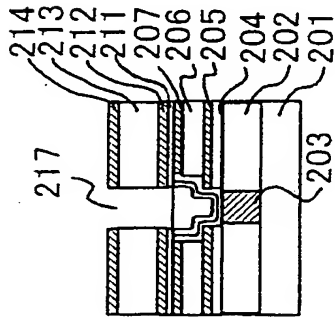


FIG. 15c

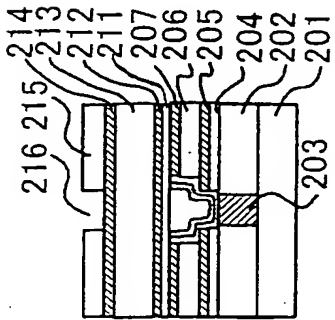


FIG. 15b

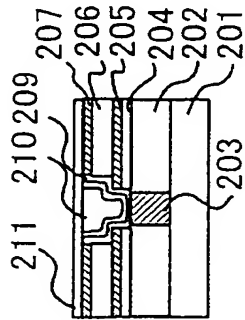


FIG. 15a

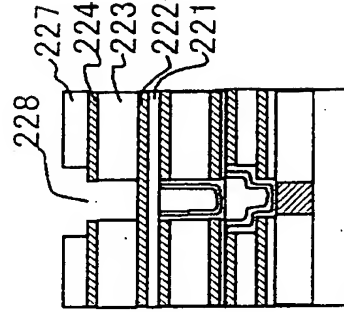


FIG. 15h

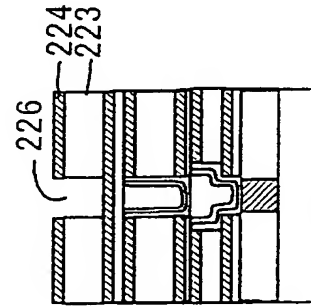


FIG. 15g

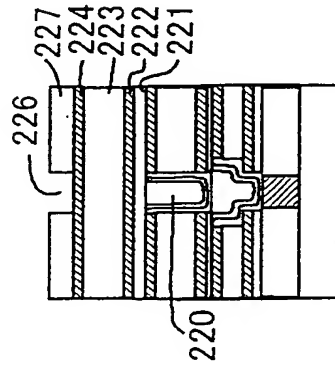


FIG. 15f

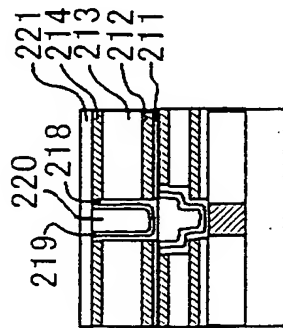


FIG. 15e

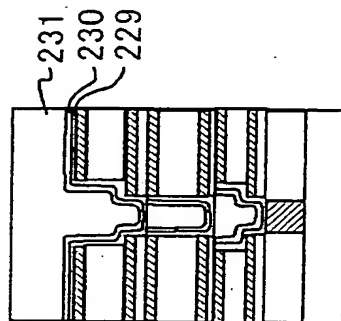


FIG. 15j

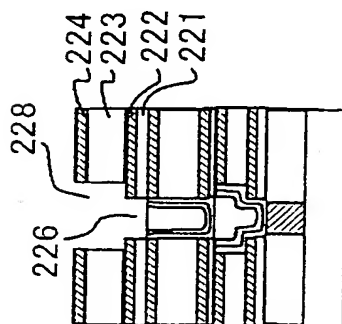


FIG. 15i

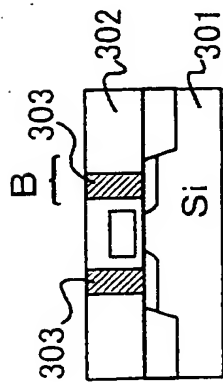


FIG. 16a

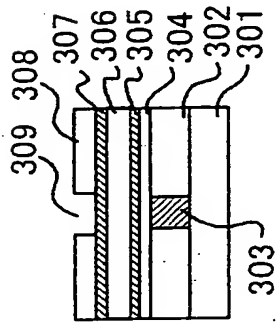


FIG. 16b

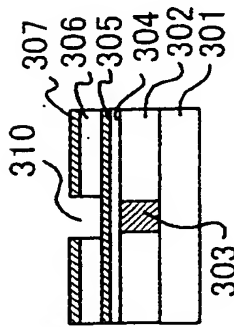


FIG. 16c

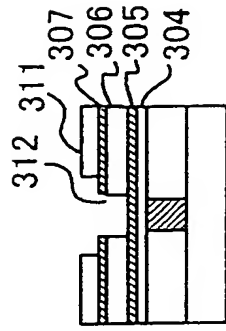


FIG. 16d

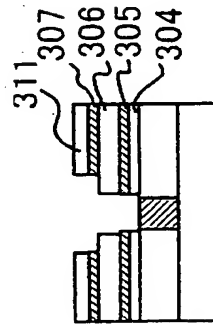


FIG. 16e

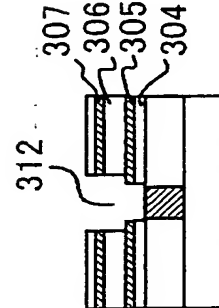


FIG. 16f

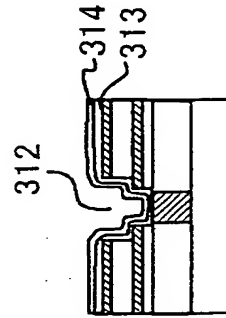


FIG. 16g

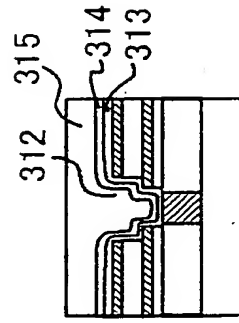


FIG. 16h

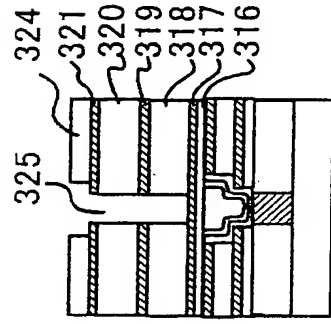


FIG. 16i

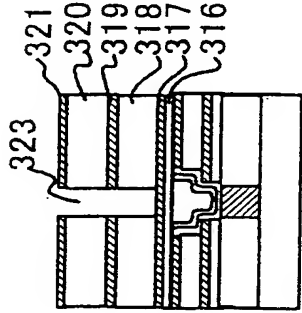


FIG. 16j

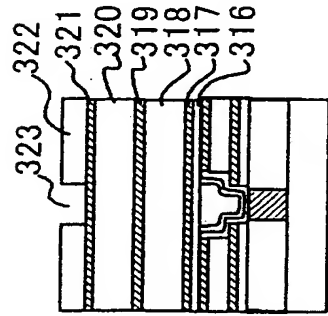


FIG. 16k

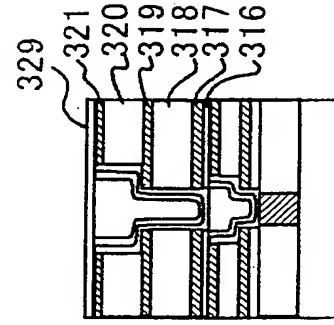


FIG. 16l

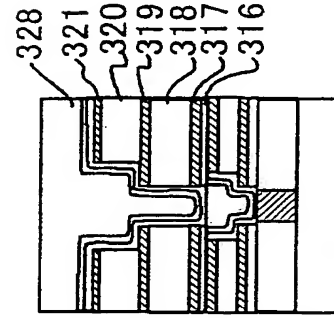


FIG. 16m

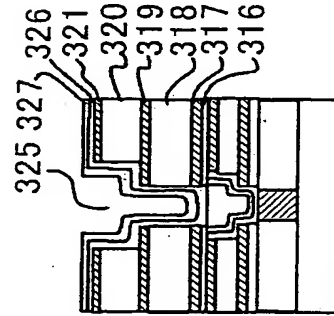


FIG. 16n

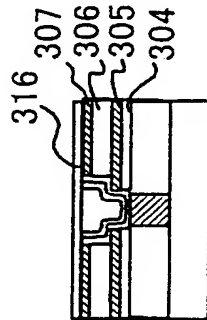


FIG. 16o

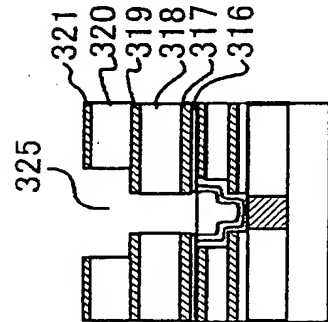


FIG. 16p

This diagram shows a cross-sectional view of a semiconductor device. It features a substrate with a gate stack on top. The gate stack includes a gate dielectric layer (404) and a gate conductive layer (405). A trench (410) is formed in the substrate, and a gate conductive layer (406) is deposited in the trench. The gate conductive layer (406) is shown as a hatched region. The gate dielectric layer (404) is shown as a white region. The gate conductive layer (405) is shown as a hatched region. The trench (410) is shown as a white region.

This cross-sectional view shows a trench 411 formed in a substrate 402. The trench is filled with a material 404. A layer 405 is deposited on the top surface of the substrate 402 and the inner walls of the trench 411. A top layer 406 is deposited on the layer 405. The trench 411 is filled with a material 404, and the layer 405 is deposited on the top surface of the substrate 402 and the inner walls of the trench 411.

A cross-sectional view of a semiconductor device. A trench (411) is formed in a substrate (404). The trench is filled with a material (414). The trench is lined with a material (413). The trench is filled with a material (412). The trench is filled with a material (406). The trench is filled with a material (405).

FIG. 17h

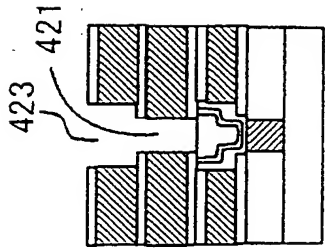


FIG. 17i

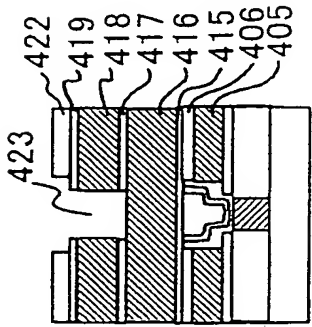


FIG. 17k

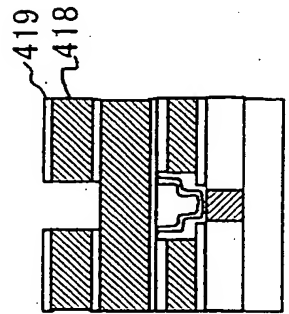


FIG. 17j

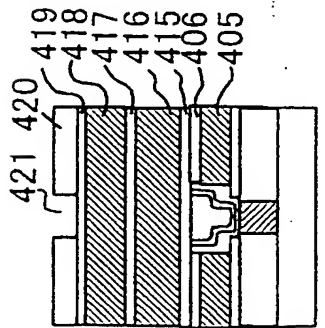


FIG. 17i

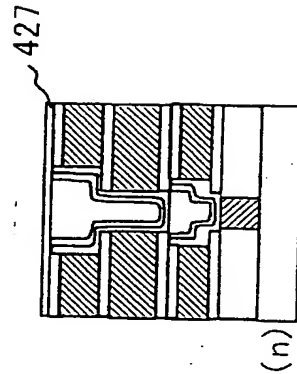


FIG. 17n

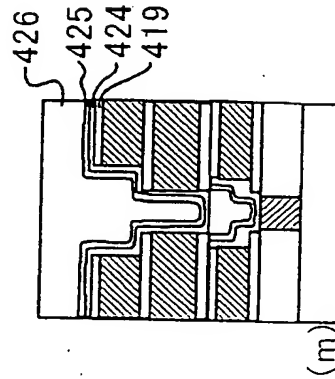
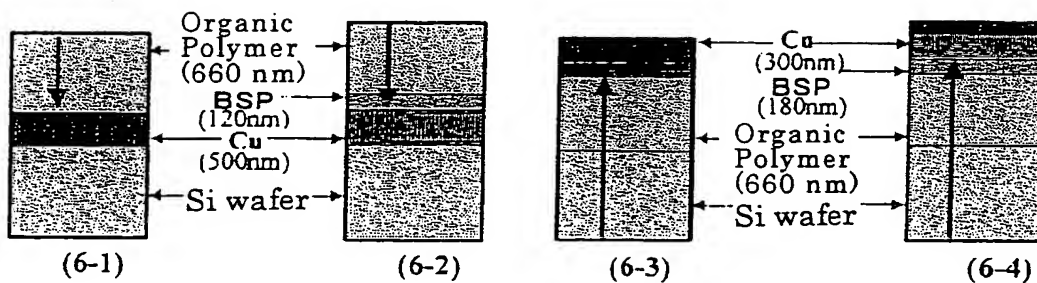


FIG. 17m

17 / 23

FIG. 18a

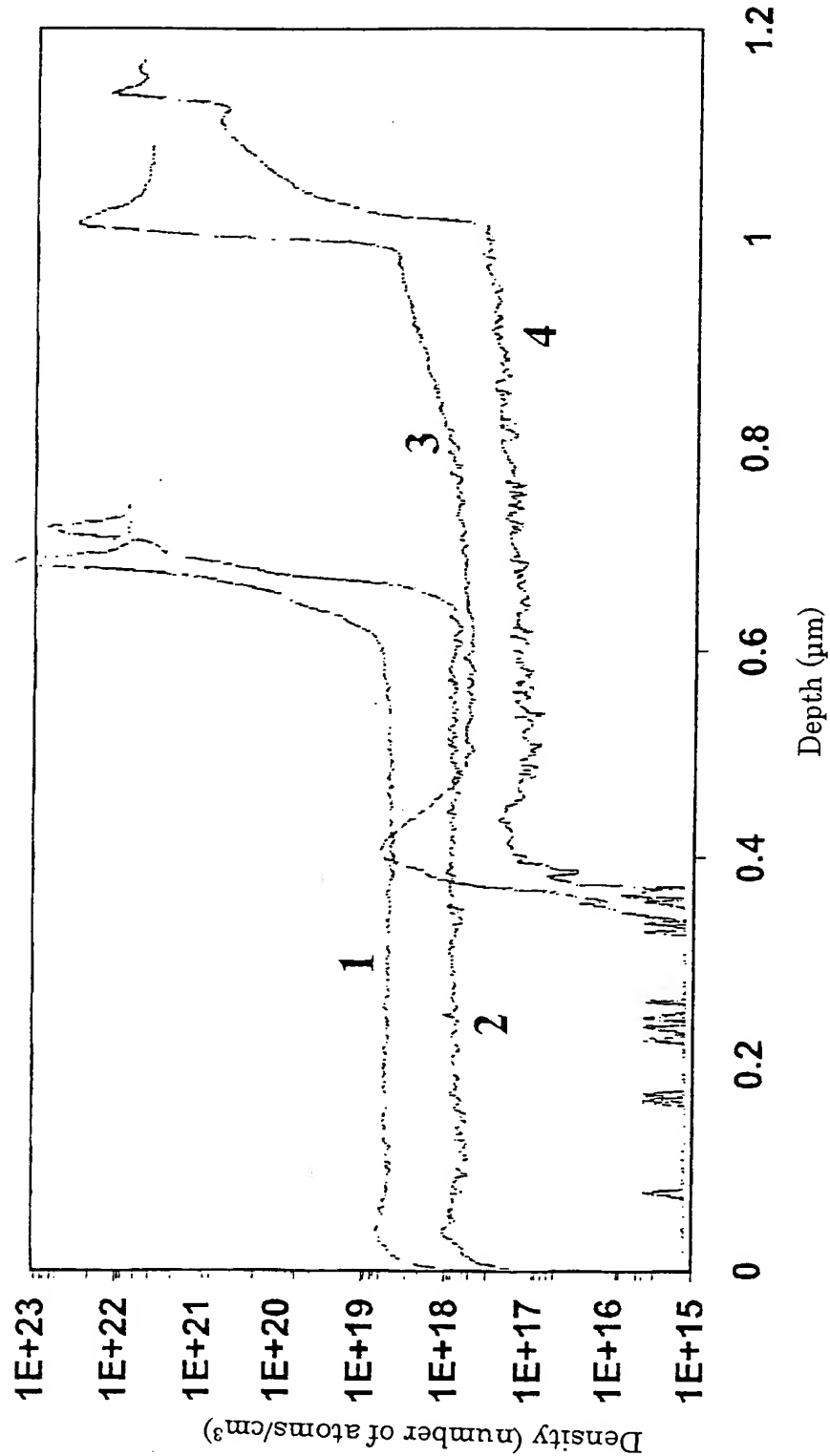


	Structure	Cu atoms/cm ³
1	Si / Cu(500nm) / OP(660nm)	5×10^{18}
2	Si / Cu(500nm) / BSP(120nm) / OP(660nm)	8×10^{17}
3	Si / OP(660nm) / Cu(300nm)	6×10^{17}
4	Si / OP(660nm) / BSP(180nm) / Cu(300nm)	1×10^{17}

FIG. 18b

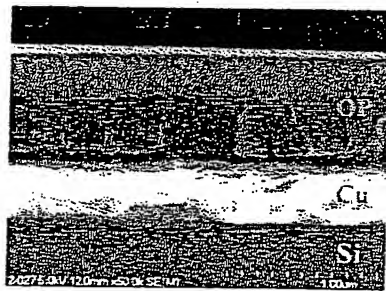
18 / 23

FIG. 19



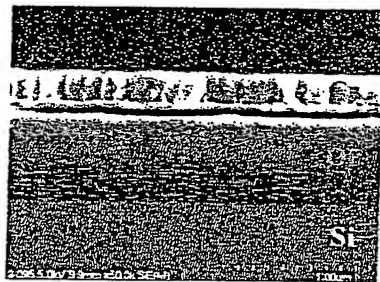
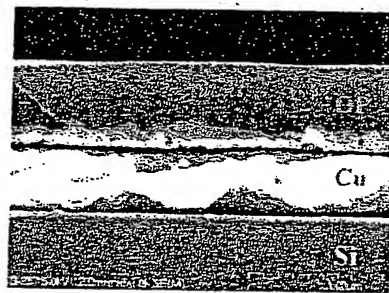
19 / 23

FIG. 20a



Annealing
400°C
6hrs

FIG. 20b



Annealing
400°C
6hrs

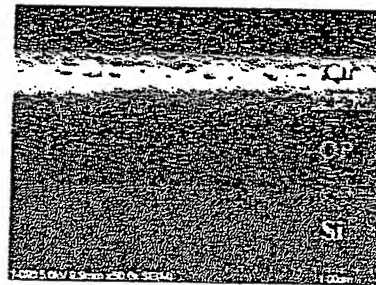


FIG. 20c

FIG. 20d

20 / 23

FIG. 21a

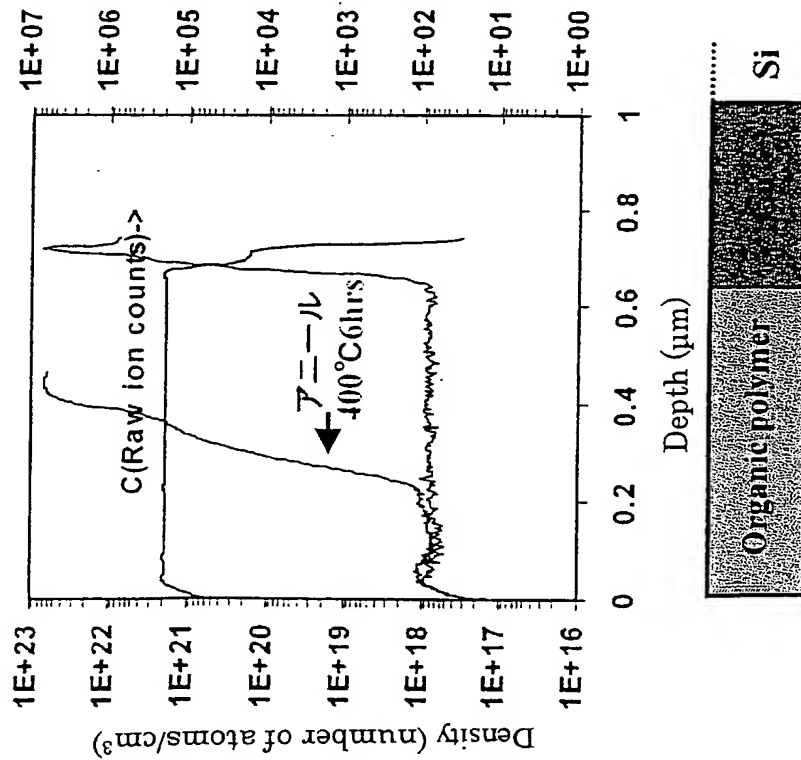


FIG. 21c

FIG. 21b

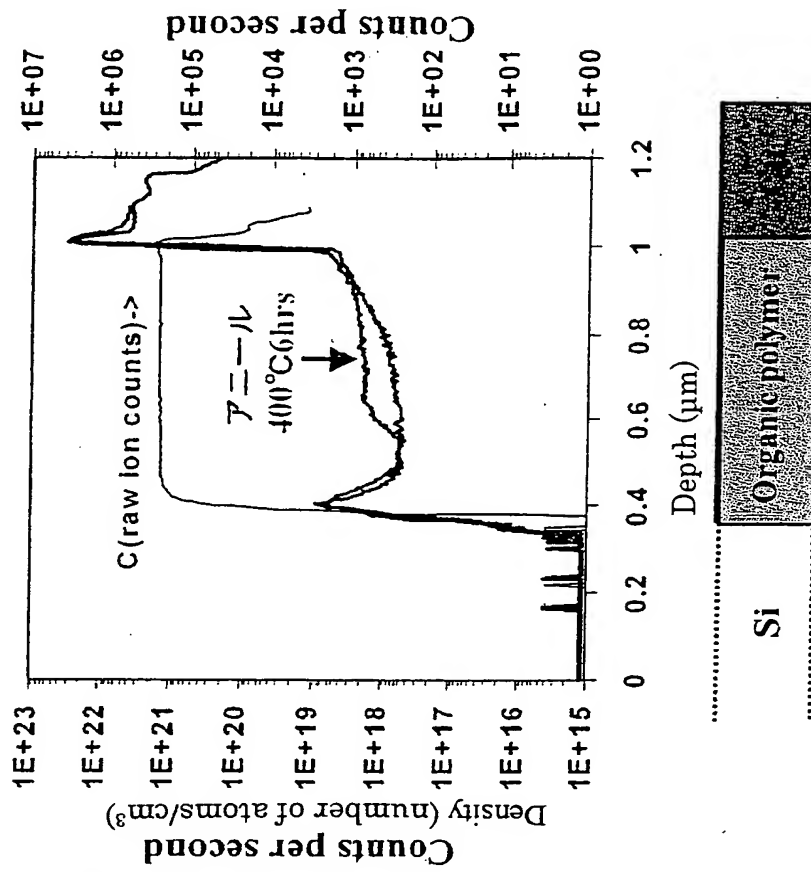
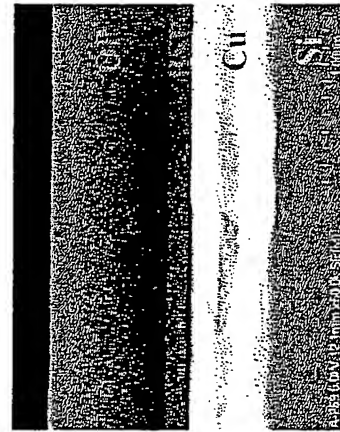


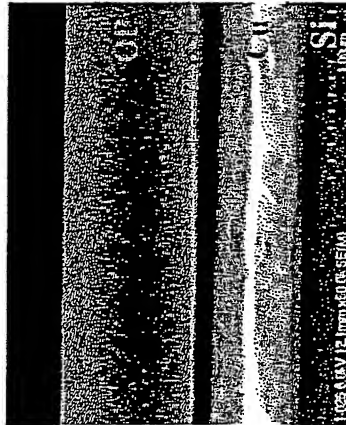
FIG. 21d

21 / 23

FIG. 22



Annealing
↑
400°C·6hrs



22 / 23

FIG. 23a

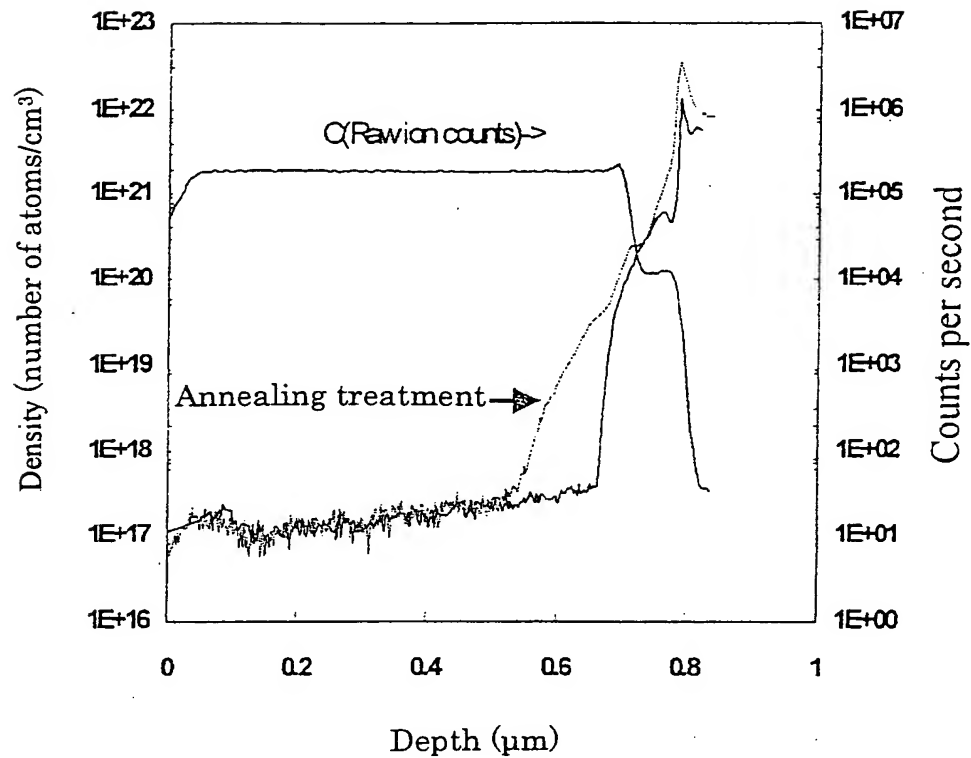
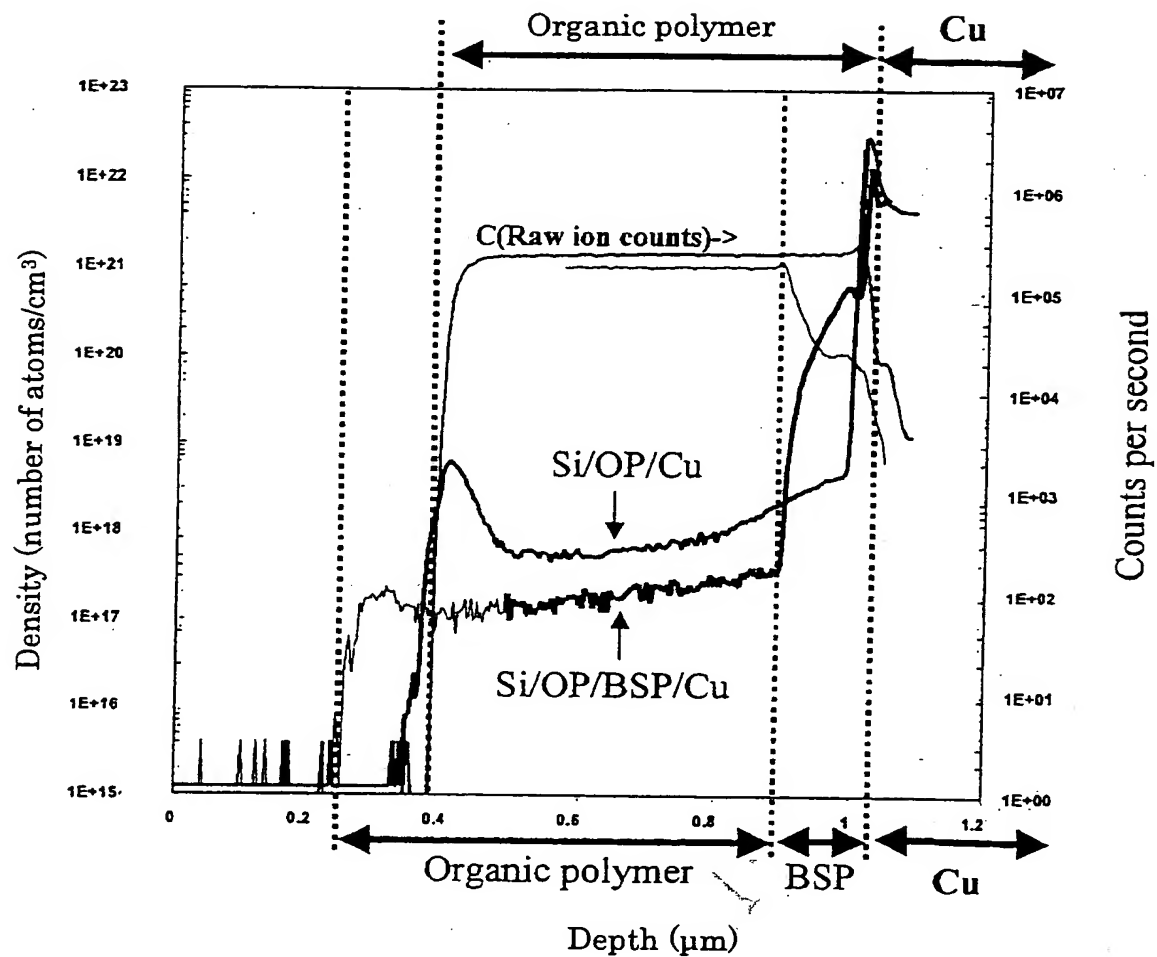


FIG. 23b

23 / 23

FIG. 24



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